

Skylights

Newsletter of the Astronomical Society of Northern New England



July 2020



Member of NASA's Night Sky Network



Astronomical League

ASNNE MISSION

ASNNE is an incorporated, non-profit, scientific and educational organization with three primary goals:

- 1) To have fun sharing our knowledge and interest with others.
- 2) To provide basic education in astronomy and related sciences to all who are interested.
- 3) To promote the science of Astronomy.

What's Up In July

By Bernie Reim

The month of July is named after Julius Caesar. This is the first full month of summer and the days are already getting several minutes shorter each day now but they are still well over 15 hours long. There are many interesting highlights for everyone to observe in both the morning and evening sky during this warm summer month.

Two planets, a dwarf planet, and an asteroid will reach opposition this month. Three planets will grace our evening sky again after a long absence of evening planets and two planets will make dramatic appearances in our morning sky. There will also be some nice conjunctions of the moon with Jupiter and Saturn in the evening sky and Venus and Mercury in the morning sky. Then the first good meteor shower since the April Lyrids will be the Delta Aquarids which will peak on Tuesday the 28th. Then there will even be another partial penumbral lunar eclipse.

Jupiter is rising about 4 minutes earlier each evening. The king of the planets starts this month rising at about 9:30 pm and it will rise right at sunset on the 14th when it reaches opposition. Jupiter went into retrograde or westward motion against the fixed background of stars 2 months ago and it will end its retrograde in 2 more months. When a superior planet reaches opposition it is always right in the middle of the retrograde loop that it traces through our sky. This is only an optical illusion since none of the planets actually stop moving forward and then back up for a few months. It only seems that way because we are orbiting in the same plane around the sun, which is called the ecliptic. As the faster planet, earth in this case, catches up with and passes the slower moving planet, Jupiter, there will be a few months during which the slower planet seems to be moving backwards in our sky. This happens to all of the superior planets from Mars out to Neptune as we catch up with them and then pass them in our faster and tighter orbit around the sun. There were many clever and involved explanations for this when we still believed we

lived in a geocentric solar system, but once we figured out that we actually live in a heliocentric solar system, all of this motion could be explained very simply.

Saturn rises shortly after Jupiter and will reach its own opposition about a week later, on the 20th. The ringed planet is twice as far away as Jupiter. At nearly 1 billion miles away, it takes light 1 hour and 20 minutes to get to us from Saturn. Notice that Saturn has a slight golden hue and is fully 15 times or 3 magnitudes fainter than Jupiter. You will be able to see Titan and a few of the other larger moons of Saturn in a telescope. You can easily see all 4 of the larger Galilean moons of Jupiter through a telescope. Jupiter now has 79 known moons and Saturn is up to 82.

Mars starts the month rising just after midnight and it will end the month rising by 11:15 p.m. The red planet gets dramatically brighter and larger this month as we catch up with it in our orbits around the sun, even though it will not reach its opposition until the middle of October.

"Continued on page 2"

Inside This Issue

Club Contact List	pg 2
Moon Data	pg 3,4,5
Observer's Challenge	
RED ALERT: LASERS IN SPACE	pg 6
Club Merchandise for Sale	
Meteor Showers in 2020	
Mars Latest Visitor: NASA's Perseverance Rover	pg 7,8
Astroimaging with a Point & Shoot	pg 9
Club Meeting & Star Party Dates	pg 10
Directions ASNNE Locations	
Become a Member	pg 11

Club Contacts**Officers:****President:**

Ron Burk
rdavidburk@yahoo.com

Vice President:

Bernie Reim
berniereim@kw.com

Secretary:

Carl Gurtman
carlgurt@msn.com

Treasurer:

Ian Durham
idurham@anselm.edu

Board of Directors:

Gary Asperschlager
gasperschlager@gmail.com

Larry Burkett
larrybu32@yahoo.com

Keith Brown
silverado93@twc.com

Star Party**Co-ordinator:**

Carl Gurtman
carlgurt@msn.com

Skylights Editor:

Paul Kursewicz
pkursewicz@myfairpoint.net

Website Manager:

Nan Musgrave
mzgrvz@outlook.com

NASA Night Sky**Network****Co-ordinator:**

Joan Chamberlin
starladyjoan@yahoo.com

**JPL Solar System
Ambassador:**

Joan Chamberlin
starladyjoan@yahoo.com

What's Up "Continued from page 1"

Brilliant Venus reappeared in our morning sky last month and will make a dramatic climb higher into our morning sky this month. This will be its steepest climb in 8 years, which is the length of time a cycle of Venus orbits takes. For every 8 earth years, Venus makes 13 orbits around the sun and it will pass through inferior conjunction with the earth like it just did on June 3 five times in that same time period. All three of those numbers, 5, 8 and 13, are consecutive Fibonacci sequence numbers, which explain a lot of natural phenomena including how twigs and leaves grow on branches and how sunflowers spiral. You just add the previous two numbers to attain the next number. The next few numbers in this great natural sequence made more famous by Dan Brown in "The Davinci Code" are 21, 34, 55, 89, and 144.

Venus will pass through the Hyades star cluster in Taurus this month and the waning crescent moon will be visible close to it on the 17th and then it will pass near Mercury low on the horizon on the 19th half an hour before sunrise.

The Delta Aquarids will peak on Tuesday morning the 28th. They will start more than a week earlier and they will also overlap with the Perseids which will not peak until the 12th of August, but start several weeks before then. The Delta Aquarids are caused by Comet 96/P Machholz. So you will see tiny sand grain-sized pieces of this not so famous comet smash into our atmosphere at 25 miles per second, which is just a little faster than we orbit the sun. The moon will be just past first quarter, so it will interfere a little until it sets around 1 am.

The third largest asteroid, Pallas at 317 miles across, will reach opposition in Vulpecula the Fox on the 12th. It will only reach 9.6 magnitude, so would need a good pair of binoculars or a telescope to see it for yourself.

The dwarf planet Pluto will reach opposition in Sagittarius on the 15th. It spends 20 years in each of the 12 zodiac constellations on its 248 year orbit, so it never appears to move much in our sky. Pluto will reach 14.3 magnitude, so you would need a good 8 inch or larger telescope to see it at all. That is fully 18 magnitudes or 100 million times fainter than Venus. Every 5 magnitudes equals 100 times. This is a log arithmetic scale.

We have the 5th anniversary of New Horizons close approach to Pluto on July 14 of 2015. Since then the spacecraft has also visited another Kuiper belt object recently renamed Arrokoth on January 1 of 2019. New Horizons is still working fine and constantly monitoring radiation and other factors in the Kuiper Belt at over 5 billion miles out or over 7 hours away at the speed of light.

July 4. Earth is at aphelion, or farthest from the sun today at just over 94.5 million miles, or about 3% farther away than it is at perihelion on January

The Crab nebula in Taurus exploded as a supernova on this day in the year 1054. Since it is located about 6500 light years away, it actually exploded about 7500 years ago and we just saw it 1,000 years ago. All the major cultures on Earth at that time have recorded and drawn pictures of this great heavenly event. Henrietta Swan Leavitt was born on this day in 1879. She was one of the now famous Harvard Computers who established the stellar classification system and helped us learn much more about the true nature of all stars. She even went beyond that by discovering the period-luminosity relationship in Cepheid Variable stars, which states that the intrinsically brighter Cepheids must have longer periods of varying in brightness on regular cycles. This allowed them to be used as standard candles or cosmic yardsticks that allowed us to accurately determine distances to nearly galaxies out to 100 million light years or so. She deserved to win the Nobel Prize for that great discovery, but she was passed over for that honor. Two more famous women astronomers were born this month and both of them also deserved the Nobel Prize for their impactful and important discoveries.

July 5. Full moon is at 12:44 a.m. EDT. This is also called the Hay or Thunder Moon. Isaac Newton published his famous Principia on this day in 1687. The moon passes near Jupiter and Saturn tonight.

July 11. Mars and the moon are just 6 degrees apart this morning and Venus and Aldebaran in Taurus are just one degree apart.

July 12. Last quarter moon is at 7:30 p.m.

July 14. Jupiter is at opposition. New Horizons passed close to Pluto on this day in 2015.

July 15. Jocelyn Bell Burnell was born on this day in 1943. She discovered the first pulsar, which is a rapidly spinning neutron star, the result of a supernova explosion like the Crab Nebula, in 1967 with a radio telescope. They jokingly named it LGM, for Little Green Men, since it gave out regular signals as if it had intelligence.

July 16. On this day in 1994 the first of 21 pieces of Comet Shoemaker-Levy 9 smashed into Jupiter, leaving large black marks in its cloud systems. Another piece hit every 6 hours after that for 6 more days. I saw and sketched 5 of these huge chunks of that comet hit Jupiter just after it happened when Jupiter spun the marks into view.

July 17. The moon is near Venus this morning and near Mercury on the 19th.

July 20. Saturn is at opposition all night. New moon is at 1:34 p.m.

July 23. Vera Rubin was born on this day in 1928. She studied stellar rotations in galaxies and first proposed dark matter as being the cause of all the stars moving at about the same speed.

July 27. First quarter moon is at 8:34 a.m.

July 28. The moon is near Antares in Scorpius this evening.

Moon Phases

July 5
Full

July 12
Last Quarter

July 20
New

July 27
First Quarter

Moon Data

July 5
Jupiter 1.9° north
of Moon

July 6
Saturn 2° north
of Moon

July 10
Neptune 4° north
of Moon

July 11
Mars 2° north
of Moon

July 12
Moon at apogee

July 14
Uranus 4° north
of Moon

July 17
Venus 3° south
of Moon

July 18
Mercury 4° south
of Moon

July 25
Moon at perigee

OBSERVER'S CHALLENGE* – July, 2020

by Glenn Chaple

Messier 8 – Nebula/Cluster in Sagittarius (Mag: 3.0, Size: 90' X 40')

Our July and August Observers' Challenges might be themed the "Summer of Sagittarius," as both inhabit the celestial Archer. This month, we set our sights on Messier 8 (the "Lagoon Nebula"); in August, we'll turn our attention to Messier 20 (the Trifid Nebula).

Along with the Orion Nebula (M42), the Lagoon is the only diffuse nebula readily visible to the unaided eye from mid-northern latitudes. Like M42, it's an emission nebula and an H II region of active star formation. Credit for the discovery of the Lagoon Nebula goes to the Italian astronomer Giovanni Hodierna who spotted it with a crude 20X refractor on or before 1654. Because the nebula is visible to the unaided eye, we can rightly assume that a number of astute observers spotted it long before Hodierna. Messier added it to his catalog in 1764. It bears the New General Catalogue designation NGC 6523.

I first saw M8 on the evening of July 20, 1974 – coincidentally, the 5th anniversary of the Apollo 11 moon landing. This was definitely a NASA-themed night, as the session began with a fly-over of the Skylab space station. M8 was visible to the unaided eye a half-dozen degrees north of gamma (γ) Sagittarii, the star that marks the spout of the "Teapot." It was easily seen in my 3-inch f/10 reflector at 30X as two separated nebulous patches oriented in a north/south direction. I made another small-scope observation of the Lagoon in the summer of 2012 – this time with a 4.5-inch f/8 reflector and a magnification of 75X. I described it as "two elongated clumps of nebulosity separated by a dark rift. Beautiful cluster (NGC 6530) to the east." Since NGC 6530 is embedded in the nebulosity, it's obvious that a larger instrument will be necessary to fully appreciate the grandeur of the Lagoon.

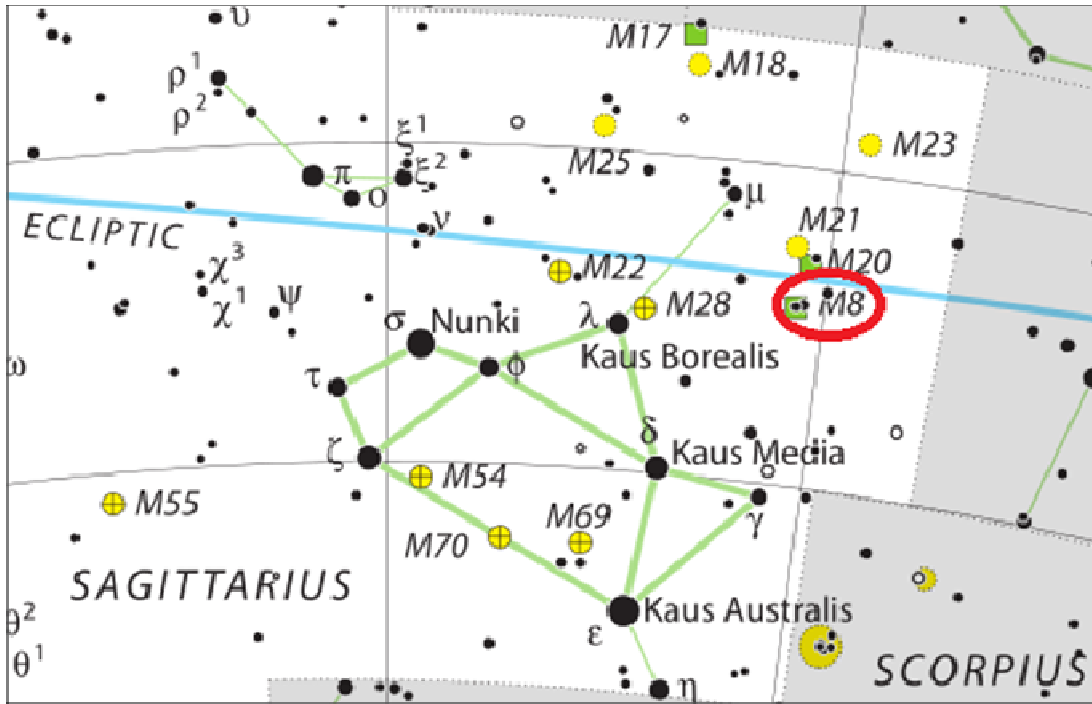
The immensity of the Lagoon Nebula can be fully appreciated when we realize that, although it lies 5200 light years away, its widest dimension spans an area three full moons across. Were it as close as the Orion Nebula, the Lagoon would appear four times larger and shine at first magnitude.

For a detailed look at Messier 8 from a backyard astronomer's point of view, read Howard Banich's article "Swimmin' in the Lagoon" on pages 20-25 of the August, 2020, issue of *Sky and Telescope*. Banich mentions the "Hourglass," a small, bright part of the Lagoon Nebula that was first described by John Herschel. It appears in the accompanying Mario Motta narrow-field image of the Lagoon. Here's a challenge for you big-scope users. Can you make a visual sighting?

*The purpose of the Observer's Challenge is to encourage the pursuit of visual observing. It is open to everyone who is interested. If you'd like to contribute notes, drawings, or photographs, we'll be happy to include them in our monthly summary. Submit your observing notes, sketches, and/or images to Roger Ivester (rogerivester@me.com). To find out more about the Observer's Challenge or access past reports, log on to rogerivester.com/category/observers-challenge-reports.

"Continued on page 4"

Finder Chart for M8 (The “Lagoon Nebula”)



www.messier-objects.com (chart from IAU and *Sky and Telescope*)

Images of Messier 8

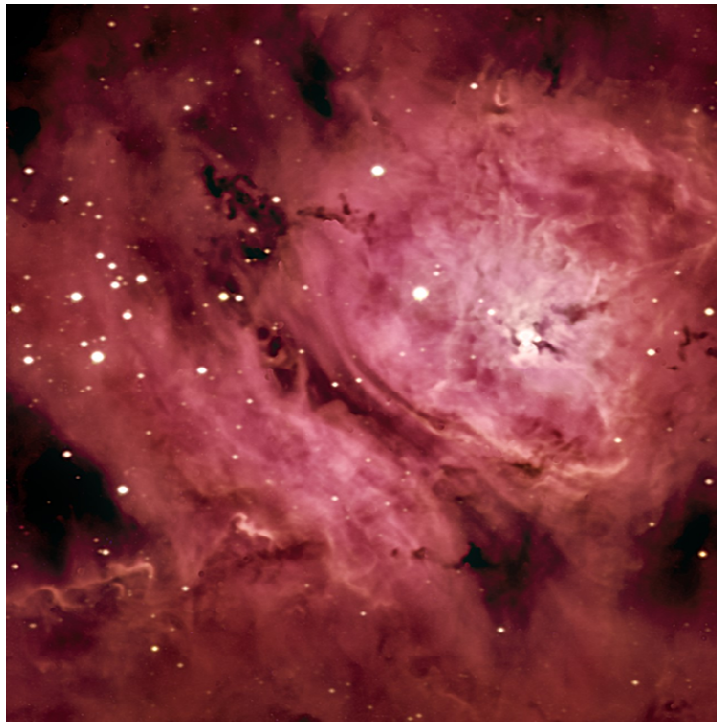


M8, as seen with 4.5-inch f/8 reflector. Sketch by Glenn Chaple

“Continued on page 5”



M8 - Wide-field view, taken with 8-inch Ritchey-Chrétien telescope and Lum, R,G,B filters, also some Ha added to Lum and Red. Total imaging time about 3.5 hours. Image by Mario Motta, MD (ATMoB)



M8 - Narrow-field view, taken with 32-inch scope showing the center of the lagoon and the star forming region to the right of the lagoon itself (the hourglass shape glow) .Image taken with narrowband imaging Ha, O3, and S2, total about 3 hours. Image by Mario Motta, MD (ATMoB)

Principal Meteor Showers in 2020

January 4
Quadrantids

April 22
Lyrids

May 6
Eta Aquarids

July 30
Delta Aquarids

August 12
Perseids

October 9
Draconid

October 21
Orionids

November 9
Taurids

November 18
Leonids

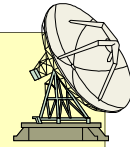
November 26
Andromedids

December 14
Geminids

December 22
Ursids

*Note: Dates are
for maximum*

Got any News?
Skylights Welcomes Your Input.



Here are some suggestions:

*Book reviews -- Items for sale -- New equipment --
Ramblings -- Star parties -- Observing -- Photos.*

Our Club has Merchandise for Sale at: www.cafepress.com/asne



*ALL money raised goes to our operating fund.
Any design can be put on any item.*

Contact David Bianchi dadsnorlax@yahoo.com for further details.

RED ALERT – Downward Pointing Lasers

NASA is planning to use (or is already using) downward pointing lasers which are mounted on their spacecrafts. For those of us who look at the night sky through a telescope, or a pair of binoculars, this is a potential hazard. If a laser beam enters our instrument at the very time we are viewing, eye injury or blindness could occur. Contact physicist, Dr. Jennifer Inman, jennifer.a.inman@nasa.gov and tell her your concerns about this perilous issue. Why should we have to live in fear each time we look into a telescope or a pair of binoculars? This is unacceptable!



This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.org to find local clubs, events, and more!

Mars's Latest Visitor: NASA's Perseverance Rover

By David Prosper

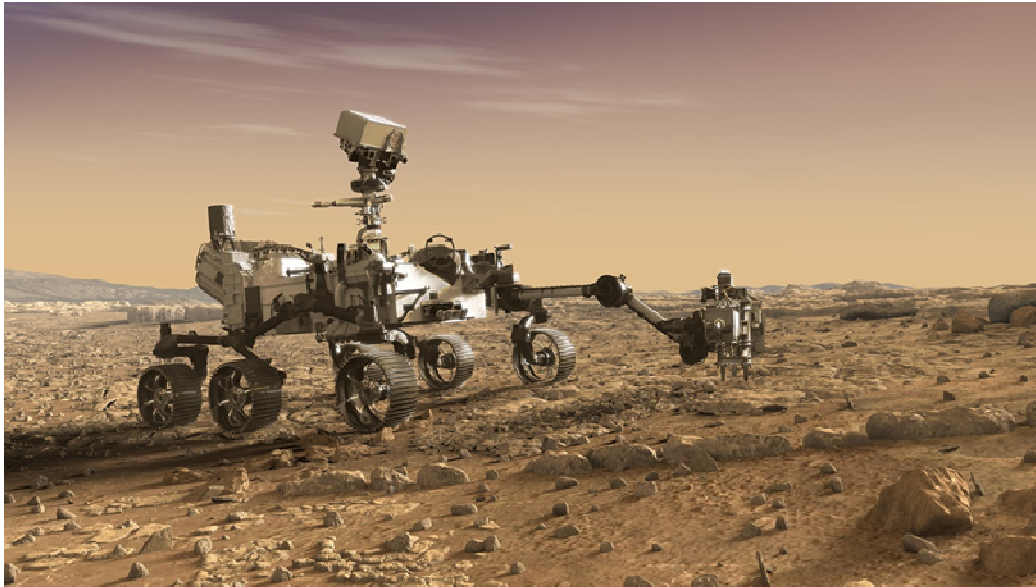
NASA's latest Mars rover, Perseverance, is launching later this month! This amazing robot explorer will scout the surface of Mars for possible signs of ancient life and collect soil samples for return to Earth by future missions. It will even carry the first off-planet helicopter: Ingenuity. Not coincidentally, Perseverance will be on its way to the red planet just as Mars dramatically increases in brightness and visibility to eager stargazers as our planets race towards their closest approach in October of this year.

Perseverance's engineers built upon the success of its engineering cousin, Curiosity, and its design features many unique upgrades for a new science mission! In February of 2021, Perseverance will land at the site of an ancient river delta inside of Jezero Crater and ready its suite of seven primary scientific instruments. The rover will search for traces of past life, including possible Martian fossils, with WATSON and SHERLOC, two advanced cameras capable of seeing tiny details. The rover also carries an amazing instrument, SuperCam, to blast rocks and soil outside of the rover's reach with lasers to determine their chemical makeup with its onboard suite of cameras and spectrometers. Perseverance will also take core samples of some of the most promising rocks and soil, storing them for later study with its unique caching system. Future missions will retrieve these samples from the rover and return them for detailed study by scientists on Earth. Perseverance also carries two microphones so we can hear the sounds of Mars and the noises of its instruments at work. It will even launch a small helicopter - Ingenuity - into the Martian atmosphere as a trial for future aerial exploration!

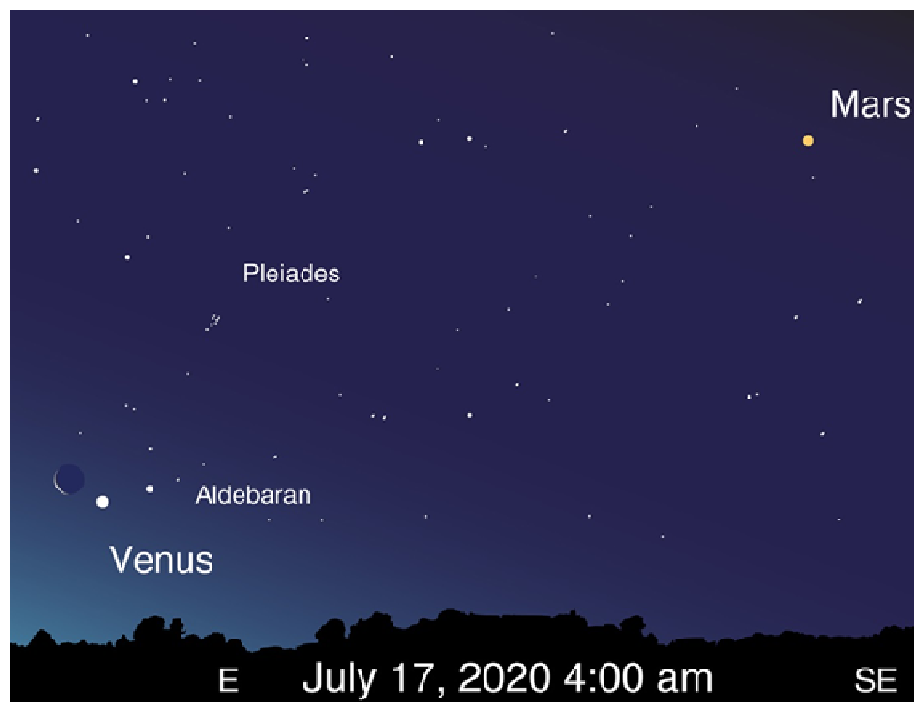
Would you like to contribute to Mars mission science? You can help NASA's rover drivers safely navigate the Martian surface by contributing to the AI4Mars project! Use this tool to label terrain features on photos taken of the Martian surface by NASA missions to help train an artificial intelligence algorithm to better read their surrounding landscape: bit.ly/AI4Mars

The launch of Mars Perseverance is, as of this writing, scheduled for July 20, 2020 at 9:15am EDT. More details, updates, and livestreams of the event are available on NASA's official launch page: bit.ly/Mars2020Launch . Dig deep into the science of the Mars 2020 mission and the Perseverance rover at: mars.nasa.gov/mars2020/ . Find out even more about past, present, and future Mars missions at nasa.gov.

“Continued on page 8”



Perseverance inspects a cluster of interesting Martian rocks with its instruments in this artist rendering by NASA JPL/Caltech



Observe Mars yourself over the next few months! Mars can be found in early morning skies throughout July, and by the end of the month will rise before midnight. Mars gradually brightens every night until the close approach of Mars in October. The pre-dawn skies of July 17 present an especially nice view, as the waning crescent Moon will appear near Venus and Aldebaran.

Point and Shoot Camera Astroimaging (no telescope)

Canon Powershot SX50 HS

Image & write-up submitted by Paul Kursewicz

Ring Nebula (M57)

Specs: JPEG, f/3.5, FL 1800mm (75X digital), ISO 1600, 24 x 1 min, 6-14-20



The **Ring Nebula (M57)** is a planetary nebula in the northern constellation of Lyra. It has an apparent magnitude of 8.8 and lies at an approximate distance of 2,300 light years from Earth. Although it is relatively bright, it is a very small object with an angular diameter of about 80 arc seconds. Even at a focal length of 1800mm, it still looks tiny in my picture. Thus, the nebula is too small to be resolved with 10x50 binoculars. It is best observed using a telescope with an aperture of at least 8 inches, but even a 3 inch telescope will reveal its elliptical ring shape. Planetary nebulae are formed when a dying red giant star expels its shell of ionized gas to form the nebula, while the star itself becomes a white dwarf. The different colors produced by the Ring Nebula are the result of temperature differences, the hot inner gas is blue whereas the cooler outer gas is red (barely seen here in its circumference). The Ring Nebula is around 1 light year across and is expanding at a rate of 1.5 million kilometers per day. It's one of my favorite objects to view through a telescope. I can recall my first time viewing the Ring, an ethereal object that looked like a small smoke ring floating in space.

Club Meeting & Star Party Dates

Date	Subject	Location
<u>July 3</u>	<p><u>ASNNE Club Meeting:</u></p> <p>Our July Club meeting at The New School has been cancelled due to the Coronavirus.</p> <p>There are plans in the making to still have our Club Meeting while staying at home by using ZOOM.</p> <p>So, a computer or a phone will be required. Ian Durham has volunteered to organize all of this. As we get closer to Friday, Ian will post a connection link to join Zoom.</p> <p><u>Topic:</u> TBD. Bernie Reim will do "What's Up." Astro Shorts</p>	<u>The New School, Kennebunk, Me.</u>
<u>Last Month</u>	At our Zoom meeting last month Bernie Reim gave his "What's Up" talk. Following Bernie, Ian Durham gave a presentation on Stellar Nucleosynthesis."	
<u>TBD</u>	Club/Public Star Party: Cancelled due to the Coronavirus.	Talmage Observatory at Starfield West Kennebunk, Me.

Directions to ASNNE event locations

Directions to The New School in Kennebunk [38 York Street (Rt1) Kennebunk, ME]

For directions to The New School you can use this link to the ASNNE NSN page and then click on "get directions" from the meeting location. Enter your starting location to generate a road map with complete directions. It works great. http://nightsky.jpl.nasa.gov/club-view.cfm?Club_ID=137

Directions to Talmage Observatory at Starfield [Alewife Road, Kennebunk, ME]

From North:

Get off turnpike at exit 32, (Biddeford) turn right on Rt 111. Go 5 miles and turn left on Rt 35. Go 2 miles on Rt 35 over Kennebunk River to very sharp 90 degree left turn. The entrance to the Starfield Observatory site is at the telephone pole at the beginning of the large field on the left. Look for the ASNNE sign on the pole.

From South:

Get off the turnpike at exit 25 in Kennebunk. After toll both turn right on Rt 35. Go up over the turnpike and immediately turn right on Rt 35. About 4 miles along you will crest a hill and see a large field on your right. Continue until you reach the end of the field. Turn right into the Starfield Observatory site at the last telephone pole along the field. Look for the ASNNE sign on the pole. If you come to a very sharp 90 degree right turn you have just passed the field.

To join **ASNNE**, please fill out the below membership form. *Checks should be made payable to: Astronomical Society of Northern New England (A.S.N.N.E).* For more details, please visit our website: <http://www.asnne.org>

✂

Astronomical Society of Northern New England
P.O. Box 1338
Kennebunk, ME 04043-1338

2020 Membership Registration Form

(Print, fill out and mail to address above)

Name(s for family): _____

Address: _____

City/State: _____ Zip code: _____

Telephone # _____

E-mail: _____

Membership (check one):
Individual \$35 _____ Family \$ 40 _____ Student under 21 years of age \$10 _____ Donation _____

Total Enclosed _____

Tell us about yourself:

1. Experience level: Beginner _____ Some Experience _____ Advanced _____

2. Do you own any equipment? (Y/N) And if so, what types?

3. Do you have any special interests in Astronomy?

4. What do you hope to gain by joining ASNNE?

5. How could ASNNE best help you pursue your interest in Astronomy?

6. ASNNE's principal mission is public education. We hold many star parties for schools and the general public for which we need volunteers for a variety of tasks, from operating telescopes to registering guests to parking cars. Would you be interested in helping?
Yes _____ No _____

7. ASNNE maintains a members-only section of its web site for names, addresses and interests of members as a way for members to contact each other. Your information will not be used for any other purpose. Can we add your information to that portion of our web site?
Yes _____ No _____

✂